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The Hydrogen Budget of Venus

T.M. Donahue, Principal Investigator

With the help of grant NASW-2207 from the Planetary Atmospheres program we have been able to complete the analysis of data obtained by the Pioneer Venus Large Probe Neutral Mass Spectrometer (LNMS) to determine the vertical profile of water vapor in the lower atmosphere of Venus. In performing this work we have also confirmed the very large D/H ratio we reported previously. A reprint of a paper reporting these results is attached.

Following this work we have begun an analysis of data from the LNMS relating to CH_4 and H_2 in the lower atmosphere of Venus. Preliminary results, obtained by the time this project ended, but continued since under other auspices, indicate the presence of very large quantities of highly deuterated hydrogen species in the lower atmosphere of Venus in addition to water vapor. They also have led us to revise our values for the ratio of HDO to H_2O from 100 times terrestrial to 150 times terrestrial. A reprint of a paper on this subject, based partly on support from NAGW-2207, entitled "Venus Methane and Water" is also attached.

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